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# Sporotrichosis in the Orinoco river basin of Venezuela and Colombia

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## Abstract

Six cases of sporotrichosis from the Orinoco river basin of Venezuela and Colombia are described; two are of the localized cutaneous type and four are lymphocutaneous. Diagnosis was based on the patient's clinical history and mycological culture. Epidemiology and distinctive cultural habits of the patients are discussed in connection with disease etiology.

*Abbreviations:* CAICET (Amazonas Center for Investigation and Control of Tropical Diseases); TFA (Amazonas Federal Territory)

## Introduction

*Sporothrix schenckii,* the etiological agent of sporotrichosis, is well known for its saprophytic association with plant life and has been isolated numerous times from soil [14] and animals, in species as diverse as camels, chimpanzees and armadillos [12]. In man the fungus generally enters the skin by traumatic injury such as cuts, thorn pricks, splinters or insect bites [17].

Lymphocutaneous and fixed cutaneous clinical types account for 95% of reported cases [2, 6]. Rare forms involve cutaneous disseminated [15] and extracutaneous lesions [17]. Sporotrichosis is thought to occur wherever climatic conditions, such as high hygrometric values and moderate temperatures, permit [13]. There are, however, still areas and populations for which no cases have been reported. The following cases were referred to the Amazonas Center for Investigation and Control of Tropical Diseases (CAICET) in Puerto Ayacucho, Amazonas Federal Territory (TFA) for diagnosis by the dermatology clinic of the local hospital, 'Centro de Salud Salud José Gregorio Hernández'.

## Materials and methods

Six patients (5 males, 1 female) from various ethnic groups, presenting cutaneous and/or lymphocutaneous lesions were studied. Two patients were from Colombia, and four from Venezuela. Figure 1 shows the geographical distribution of the six cases. A presumptive diagnosis of sporotrichosis was made in each case based on clinical examination and patient history. Biopsies were taken for mycological analysis.

Pieces of biopsy material were teased and mounted in 10% KOH and examined by light microscopy under 40× for the presence of fungal elements, such as hyphae or spores. After being macerated, biopsy material was inoculated onto Sabouraud's glucose agar supplemented with penicillin and streptomycin and Mycobiotic agar (Difco). The cultures were incubated at 27 °C and observed weekly for growth. Identification of the colonies was confirmed by Ridell's microculture on Sabouraud's glucose agar [10].

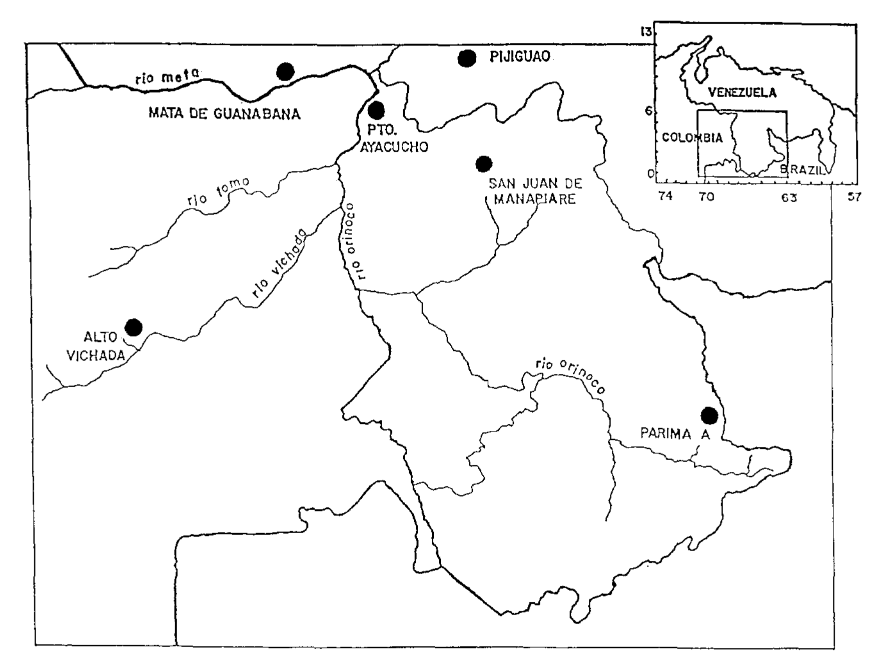



*Fig. 1.* Distribution of clinical cases of Sporotrichosis in the Orinoco river basin of Venezuela and Colombia (cases indicated with ●).

**Results**

*Clinical case 1*

A male Yanomami indian approximately 41 years old from Mayaweteri was discovered by a research group working in the Parima A region of TFA, Venezuela. Being from an indian tribe geographically isolated and of a nomadic nature, his lesions were 10 years old. In 1972, his verrucous cutaneous lesions were diagnosed and unsuccessfully treated as leishmaniasis. A clinical study of this patient revealed a 5×9 cm ulcerative lesion on the left arm, lymphoadenitis of the left axilar region, and a localized 6×8 cm vegetative lesion on the anterior face of the left thigh. The patient also had ocular lesions resulting from *Onchocerca volvulus* diagnosed by intradermic test reactivity and the presence of onchocercal microfilariae in scapular skin snips.

*Clinical case 2*

A 40-year-old male Guahibo indian from Puerto Ayacucho, Venezuela, presented at the local public hospital with chronic, inflamed, ulcerative lesions of the left leg in the area of the knee and along the draining lymphatics resulting from a machete wound received four months earlier while clearing his 'conuco', a slash and burn farm plot. The patient complained of severe itching in the affected area. Presumptive clinical diagnoses were leishmaniasis, chromomycosis or sporotrichosis.

*Clinical case 3*

A 20-year-old male Yekuana indian from San Juan de Manapiare, Venezuela, was referred to CAICET for a vegetative lesion on the right knee and another on the frontal side of the right thigh. The lesion first appeared a year ago as a small papule that later ulcerated and grew progressively. The patient did not recall any specific trauma in that area.

*Clinical case 4*

A 16-year-old male Mapoyo indian from Caño de Pijiguaos, Bolivar state, Venezuela, presented with multiple ulcerative lesions extending up the arm from the right hand. The patient stated that a pain-

less nodule appeared on his hand three weeks earlier shortly following a knife wound suffered while cleaning fish. The nodule had grown progressively to a diameter of 3 cm, and red subcutaneous nodules simultaneously appeared. These abscessed within a few days giving rise to ten ulcerative lesions along the back of the hand and forearm.

*Clinical case 5*

A 44-year-old female from Alto Vichada, Colombia, presented with an isolated abscess of the fourth finger of the right hand of approximately one year's evolution. The lesion was irregularly ovoid with a central area approximately 4 to 5 cm at the widest point, sightly raised, dry and granulomatous. There was no gangliar involvement.

*Clinical case 6*

A 63-year-old male from Mata de Guanábana on the border of the Meta river in Apure state, Venezuela, visited CAICET with a verrucous, erythemoid plaque on the front, left thigh that had been growing slowly over the past five months, now measuring 5–6 cm. The lesion was irregularly rounded and isolated. There was no precise history of initial trauma.

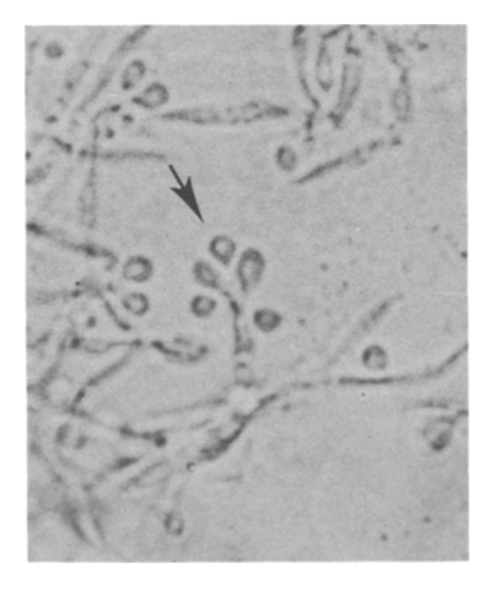


*Fig. 2.* Direct examination of a colony grown at 27 °C showing a slender tapering conidiophore bearing ovoid conidia characteristic of *Sporothrix schenckii* (400×).

*Mycological study*

In no case were fungal elements observed in direct exams of the biopsies, however, in every case growth was obtained in Sabouraud's glucose agar. Microscopic examination of the isolates showed fine (2 $\mu$ in width), branching hyphae with tapering conidiophores, occasionally bearing ovoid conidia of 2.5 to 3.5 $\mu$ in diameter (Fig. 2). Many free conidia were present also.

**Discussion**

Common histories of sporotrichosis usually include skin injury by a thorny plant or old timbers, and consequently frequently infected groups include farmers, laborers and horticulturists [1]. The infections in two cases presented appear to be consequences of work-related trauma, such as the machete wound and the knife wound. The machete was probably contaminated with soil and root fibers, as the accident occurred while working in his farm plot. The knife wound seems to have been the site of entry for *S. schenckii* in patient 4, though it is less clear whether infection occurred at the time of injury or subsequently since infection from water or clean fish scales seems unlikely. For all the cases described, however, regional and cultural characteristics exist, such as climate, housing conditions, hunting and agricultural activities thay may increase the risk of infection with *S. schenckii.*

Climatic conditions such as temperature, humidity and the presence of biting insects have all been linked to the transmission and evolution of sporotrichosis in previous studies [13]. The study area encompasses tropical dry forest to the west and tropical humid forest to the east [8] where temperatures and humidity are ideal for the growth of *S. schenckii.* There also exists a high density and variety of biting insects [11, 16].

Diverse ethnic groups are present in the study area

who largely hold to their traditional cultures. There are, however, similarities in many of their activities, specifically agriculture and hunting that predispose them to infection with -*S. schenckii.* These groups practice primitive slash and burn agriculture, farming small forest plots with only hand tools (such as knives, machetes, axes), their major crop being *Manihot*, a root. Among the animals hunted most frequently are rodents (*Dasyprocta aguti, D. fuliginosa, Agouti pace,* and *Hydrochoerus hydrochaeris*) and armadillos (*Dasypus kappleri* and *D. novemcinctus*) [3]. These animals burrow in the ground or in hollow trunks, and have previously been shown to have important roles in the transmission of sporotrichosis [4].

The indian houses are traditionally constructed with dried trunks and mud (or palm leaf) walls, palm-thatched roofs and dirt floors [5, 7, 16]. It may be, therefore, that the indian population is more likely to become infected while in their homes than block-house dwelling populations.

From this anthropological approach many theories arise to suggest the etiology of the sporotrichoses described here. With the knowledge that sporotrichosis and many predisposing climatic and cultural characteristics exist in the Orinoco river basin of Venezuela and Colombia (high temperature, humidity and density of biting insects and continual close contact with soil, plant fibers, roots, rodents and armadillos), the groundwork for further research is established.

We did not undertake an active search for cases of sporotrichosis. Nonetheless, the few cases described are broadly distributed (Fig. 1). This suggests that infection with *S. schenckii* may be common in the Orinoco river basin. It is especially important to understand the epidemiology of sporotrichosis in this area where other diseases sometimes characterized by nodular, verrucous or ulcerative lesions also occur, such as leishmaniasis, nocardiasis and onchocerciasis (CAICET, unpublished data). To facilitate rapid, accurate differential diagnosis and appropriate treatment, mycological studies are recommended for all patients with ulcerative or nodular lesions. Immunological surveys using the sporotrichin skin test could be used to determine the prevalence of infection or exposure in different local populations. Isolation of the fungi from soil, plants and animal burrows would also be helpful to identify potential local sources of *S. schenckii* and possible control measures.

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